

**PREVALENCE OF MALNUTRITION AMONG CHILDREN UNDER FIVE IN
KIRUMYA SUB COUNTY, BUNDIBUGYO DISTRICT**

BY

MUGANZI HANLORD

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**A RESEARCH REPORT SUBMITTED TO THE SCHOOL OF ALLIED
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DECLARATION

I **MUGANZI HANLORD** hereby declare that this research report is my original work and has never been submitted to this or any other university for any academic award.

.....

Signature

MUGANZI HANLORD

.....

Date

APPROVAL

This is to certify that this research report has been done under my supervision and has, to the best of my knowledge, not been presented anywhere else for another purpose. This research has been developed under my supervision and I approve it for submission.

SUPERVISOR;

MR. MWAKIO WARREN LEE

(Bsc PUBLIC HEALTH , DCM & CH,)

.....

Signature

.....

Date

AKNOWLEDGEMENT

I thank GOD for this has been the source of my strength life and he has protected me

I would like to acknowledge various people who contributed to the development of this study and I send my sincere regards to them.

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Lastly to all my friends and classmates.

DEDICATION

I dedicate this research study to my beloved mum Mutabazi Annah who never left me behind in case of any needs, May God bless you abundantly for your great commitments towards me. I cannot afford to forget my dear girlfriend, brothers, sisters and friends who have been on their toes to support my study financially, physically and spiritually. May God meet your desires according to His riches in glory. Not forgetting my supervisor Mr. MWAKIO WARREN LEE.

LIST OF ABBREVIATIONS

CDC	Centre for Disease Control
DFID	Department for International Development
GAM	Global Acute Malnutrition
MAM	Moderate Acute Malnutrition
MoH	Ministry of Health
PCM	protein-caloric malnutrition
PEM	protein-energy malnutrition
SAM	Severe Acute Malnutrition
SPRING	Strengthening Partnerships, Results, and Innovations in Nutrition Globally
UDHS	Uganda Demographic Health Survey
UBOS	Uganda Bureau Of Statistics
USAID	United States Agency for International Development
WFP	World Food Programme
WHO	World Health Organization
GOU	Government Of Uganda
UNICEF	United Nations International Children Emergency Fund
NGO	Non Governmental Organization

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OPERATIONAL DEFINITIONS

Severe acute malnutrition: A weight for height below -3 standard deviations and/or presence of bilateral pedal pitting oedema. The child's weight is expressed in standard deviations below the median weight of the NCHS/WHO reference population of children of the same height.

Oedema: Bilateral pitting oedema (swelling) involving at least the feet: presence of such oedema means that the child has oedematous severe acute malnutrition (kwashiorkor or marasmic kwashiorkor).

Exclusive breastfeeding: Feeding the baby on breast milk only (no other feeds except medications) for the first six months of life.

ABSTRACT

Malnutrition is pandemic and affects millions of people around the world and in Uganda, malnutrition contributes to about 60% of child mortality (USAID, 2010).

According to the 2011 Uganda Demographic and Health Survey, 33% children were found stunted and only 6% of the children aged 6 to 23 months were fed appropriately based on the recommended infant and young child feeding practices.

This research is therefore aimed at assessing the prevalence of malnutrition, establish factors associated with occurrence of malnutrition and review specific interventions to control malnutrition under five in Kirumya sub county, Bundibugyo district.

The study was carried out in Kirumya sub county, Bundibugyo district among children under five years and a descriptive cross sectional study design was used, sample size was determined by the Fishers et al, 2003 formula on 110 children under five and data was randomly collected.

From the study conducted, 10% were having underweight, 13% were found to be wasted and hence this was the more frequent form of under nutrition compared to underweight.

Also from the study, under nutrition was prevalent among children between 24 and 59 months possibly due to early weaning, lack of breast feeding and inadequate child spacing.

Factors associated with occurrence of malnutrition included; Short duration of breast feeding, infection which is responsible for 63.6% children with low weight for age and 61.5% of children wasted, maternal age below 20 years which is responsible for 45.5% of the children with underweight and 46.2% with wasting.

In conclusion, two forms of malnutrition; wasting and underweight are prevalent in kirumya sub county region and this prevalence among children under five is still high and this requires interventions from health workers, mothers, and MoH. The factors associated with occurrence of malnutrition were showed to be inadequate breast feeding, infections and maternal age below 20 years among other factors hence a great deal of interventions still needed to reduce the burden of malnutrition dependent on these factors.

CHAPTER ONE:

1.0 INTRODUCTION

This chapter consists of Background of the study, Problem statement, Research questions, Study objectives and Study justification

1.1 Background

Malnutrition is a quiet pandemic affecting millions of people throughout the world. Vulnerable populations, such as children, women (especially expectant mothers), the elderly and people suffering with a disability disproportionately suffer the effects of malnutrition. In addition, malnutrition exacerbates the cycle of poverty inherent in most under-developed countries. (Kristin, 2013).

Many scholars recognize the relationship between malnutrition and poverty, in fact, the World Bank states, “Reducing malnutrition is central to reducing poverty” (Ostrovsky, 2011;Phillips, 2012). The complex nature of malnutrition makes defining the problem difficult. Throughout history, the definition of malnutrition has shifted focus from protein deficiencies (the Protein Gap) to a definition based on multiple micronutrient deficiencies (Schroeder, 2010).

In the 1930’s-1970’s scholars defined malnutrition as, protein-caloric malnutrition (PCM) and protein-energy malnutrition (PEM) (Barrientos, 2011;Olwedo, 2008). The UN advocated the importance of protein deficiency in 1955 by forming the Protein Advisory Group to promote the consumption of “new protein foods” (Schroeder, 2010). Although protein deficiency remains significant, the most current definitions of malnutrition focus on the consumption of the proper amount of multiple micronutrients, such as Zinc, Iron, Iodine, Vitamin A, Folic Acid, and Selenium (CDC & WFP, 2010; Barrientos, 2011; Lyons, 2004).

While scholars agree that proteins as well as other micronutrients are important to overall nutrition, they disagree about the exact definition of malnutrition. Some definitions focus on a lack of nutrient intake (Fanzo, 2010;Olwedo, 2008; Schroeder, 2010) , for example, “Malnutrition is the cellular imbalance between the supply of nutrient energy and the body’s demand to ensure growth maintenance and specific functions” (Olwedo, 2008). Still others focus

on infections, such as helminthic infections, as the defining characteristic of malnutrition (Francis, 2012; Lokshin, 2005; Setboonsamg, 2012).

Globally, it is estimated that there are nearly 60 million children with MAM and 20 million with SAM. About 9% of sub-Saharan African and 15% of south Asian children have moderate acute malnutrition and about 2% of children in developing countries have SAM (MOH, 2010; Yebyo *et al* 2013). The majority of those affected are found in South Asia and Sub Saharan Africa. Approximately 1-2 million children die every year from severe acute malnutrition. It is reported that SAM is the commonest reason for paediatric hospital admission in many poor countries. Twenty five to 30% of children with severe malnutrition die during hospital admissions (WHO and UNICEF, 2007).

In Uganda, malnutrition contributes to about 60 percent of child mortality. The 2011 Uganda Demographic and Health Survey found that 33 percent of children were stunted and that only 6 percent of children aged 6 to 23 months were fed appropriately, based on the recommended infant and young child feeding practices. Household food insecurity, poor nutrition, and inadequate access to health care all contribute to the problem. Malnourished children and their caregivers often trek long distances for assistance at health facilities, which routinely lack supplies and trained staff. In addition, families frequently lack funds to support proper recovery.(USAID, 2010).

1.2 Problem statement

Malnutrition in children is a major public health problem in most of the developing countries and Protein Energy malnutrition (PEM) is more common among under five year children. Childhood malnutrition is a major underlying cause (>50%) of the under five year children deaths. Every year, 7.6 million children die such preventable malnutrition and its related causes. Similarly, next prevalent cause of infant and child mortality is now low birth weight which leads to intergeneration cycle of malnutrition (Collins *et al.*, 2006;[http://www.who.int/gho/child health](http://www.who.int/gho/child_health)).

In Uganda, malnutrition contributes to about 60 percent of child mortality. The 2011 Uganda Demographic and Health Survey found that 33 percent of children were stunted and that only 6 percent of children aged 6 to 23 months were fed appropriately, based on the recommended

infant and young child feeding practices. Only in the country, 2.3 million children under the age of five are chronically malnourished (Government of Uganda, 2011;UDHS, 2011).

The burden of malnutrition among under five children in Kirumya sub-county, Bundibugyo district and also information regarding associated factors is lacking. However, according to proposals from Kirumya sub-county health center III, the number of cases due to malnutrition is increasing and it has been recognized to be among the leading causes of referrals for further management. Its real burden is not known since no data is available. It had never been studied in the area. However, with increasing availability of interventions such as provision food supplements like Vitamin A to children under five , the risk of suffering from malnutrition has been substantially reduced, with all that done, the number of cases of malnutrition among under five is still a problem.

Despite the fact that different studies have been conducted on the prevalence of malnutrition among under five in Uganda information about the magnitude and spectrum of malnutrition in the study area is lacking. Therefore, this study was aimed to add updates to the existing data on malnutrition and to bridge the gaps.

1.3 Research questions

1. What is the prevalence of malnutrition among children under five in Kirumya sub-county, Bundibugyo district?
2. What are factors associated with occurrence of malnutrition among children under five in Kirumya sub-county, Bundibugyo district?
3. What are the specific interventions to control malnutrition under five in Kirumya sub-county, Bundibugyo district?

1.4.0 Study objectives

1.4.1 General objectives

To assess the prevalence of malnutrition among children under five in Kirumya sub-county, Bundibugyo district.

1.4.2 Specific objectives

- i. To assess the prevalence of malnutrition among children under five in Kirumya sub-county Bundibugyo district.
- ii. To establish factors associated with occurrence of malnutrition among children under five in Kirumya sub-county, Bundibugyo.

To review specific interventions to control malnutrition under five in Kirumya sub-county, Bundibugyo district.

1.5 Study justification

Malnutrition continues to be a problem among children under five in Kirumya sub-county, Bundibugyo district. However, no study about this so far had been done. Therefore this research was designed to help put forward information about the prevalence, associated factors and specific interventions and help health workers know, and probably help to improve health service delivery and reduce morbidity and mortality of malnourished children under five in Kirumya sub-county. The data collected and additional information from the research help Kirumya sub-county, Kirumya local government and health agencies in policy review strategies for malnourished children and it will also support the ministry of health Uganda so as to achieve good health for all.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter discusses literature review on prevalence of malnutrition, factors associated with the occurrence of malnutrition and the specific interventions to control malnutrition,

2.1 Prevalence of malnutrition

Malnutrition is a major, global health problem. Children are particularly vulnerable since adequate nutrition is essential to ensure healthy growth and development. Globally are 101 million (16 %) children under five years of age estimated being underweight (UNICEF, WHO & WB, 2012). Africa is severely affected and approximately 48 million children under five years are malnourished in Sub-Saharan Africa (UNICEF, 2013b). The majority of the countries in Africa are still struggling with the heavy burden of infectious diseases and poor maternal and child health. These countries need nutrition solutions that are adapted to their circumstances, in order to achieve improved public health (Atinmo *et al.*, 2009).

Prevalence of stunting in disadvantaged and vulnerable children (DVCs) range as high as 64.2%. More than 70% of children with protein-energy malnutrition live in Asia, 26% in Africa, and 4% in Latin America and the Caribbean (Erginet *et al.*, 2007). Within the Sub-Saharan Africa 35% and 29% of preschool children are stunted and underweight respectively (Leenstra *et al.*, 2005). According to WHO Bulletin (2002) the highest level of stunting is found in East Africa where on average 48% of pre-school children were affected. (Turyashemererwa *et al.*, 2009).

In Uganda, malnutrition contributes to about 60 percent of child mortality. The 2011 Uganda Demographic and Health Survey found that 33 percent of children were stunted and that only 6 percent of children aged 6 to 23 months were fed appropriately, based on the recommended infant and young child feeding practices. Only in the country, 2.3 million children under the age of five are chronically malnourished (Government of Uganda, 2011;UDHS, 2011).

Regionally, according to the research by Turyashemererwa *et al.*, (2009) in peri-urban Kabarole, Uganda found out that stunting was by far the most prevalent under-nutrition problem in the study area, with almost half 41.6% of the children stunted. The overall prevalence of underweight and wasting was 15.7% and 3.4% respectively.

2.2 Factors associated with occurrence of malnutrition

The substantial reasons for children's malnutrition are caused by three aspects namely immediate, underlying and basic causes. First are immediate causes which are related to poor diet and diseases, example of diseases being HIV, measles, hookworms, diarrhea among other infections. Secondly are underlying causes including food insecurity, unhygienic living conditions and inadequate health services and finally the basic causes are as a result of war, poverty, lack of information and in adequacy of resources and feeding practices and also limited appreciation of the devastating impacts (Lisa, Ramakrishnan, Ndiaye, Haddad, & Martorell, 2003; Prakash, 2010).

2.2.1 Immediate factors

According to a study done by Engebretsen, Wamani, Karamagi, Semiyaga, Tumwine and Tylleskär (2007) in eastern Uganda among 99% of the mother's breast fed. By 6 month none of the mothers practiced exclusive breast feeding practice and at 3 months only 7% exclusively breast fed. Breastfeeding has a positive impact on child's survival for children less than two years of age. Statistics show that breastfed children have at least six-times greater chance of survival in the early months than those who have not been breastfed. Multiple studies show that breastfeeding dramatically decreases deaths from diarrhoea and acute respiratory infections as well as from other infectious diseases. Acute respiratory infections and diarrhoea are the major child killers in the world (WHO, 2010).

2.2.2 Underlying factors

The underlying factors for causes of under nutrition include food security, resources for care, and resources for health and all have an effect on the immediate causes (Flax, 2010.) In many homes children live in unhealthy environment. There is no access to proper toilets or other sanitation services (GOU, 2011). According to the Ugandan newspaper, New vision (Mar 16, 2013) it is reported that half of the Ugandan population has no access to clean water and sanitation. In Uganda people need more information on the importance of proper hand hygiene like washing hands after using toilet.

The mothers have poor attitude as regards admitting malnourished children into healthcare, since in many communities in Uganda mothers do a lot in providing for the family, they usually escape

from the health facilities in order to continue working for household survival. The source of income for these mothers is brewing local beer. Therefore the mothers abscond from the hospital even though the children have not cured. In addition, the tendency for women to do small business such as brewing local beer leaves no time for food production and hence limited access to food varieties (DFID, 2011).

2.2.3 Poor feeding practices for children:

Not initiated early to breastfeeding: In Uganda, only 52 % of new-borns are breastfed in the first hour of life (Uganda Bureau of Statistics and ICF International, 2012), thus, a large proportion of new-borns miss out on the disease-protective benefits of colostrum (“first” milk, of yellowish colour).

Not exclusively breastfed: In Uganda, 63% and 41% of children under the age of 6 months and aged 4-5 months respectively are exclusively breastfed as recommended by Ministry of Health. The introduction of solid foods and liquids takes place much earlier than the recommended age of 6 months and which exposes infants to infections and poor digestion as their stomachs cannot take food other than maternal milk. Some 16% of new-borns are introduced to foods other than breast milk from the first day of life with the number doubling for those of 2 months age (Uganda Bureau of Statistics and ICF International, 2012).

Not given quality solid foods after the age of 6 months: The foods provided complementarily (additionally) to breast milk mostly consist of cereals or vegetables (such as maize/ posho or matooke) and are lacking in protein, fat and vitamins. Just one-quarter of Ugandan children aged 6-23 months are fed in accordance with the minimum WHO standard of feeding (continuous breastfeeding, 3 plus meals per day composed of 3 plus food groups each (Uganda Bureau of Statistics and Macro International, 2007).

2.2.4 Limited appreciation of the devastating impacts of malnutrition

In 2012 UNICEF sampled 150 Members of Parliament (MPs) to establish the most important issues affecting children in Uganda. MPs were asked to rank the top four most important issues within the health sector and nutrition issues were ranked lowly by most MPs (UNICEF, 2012).³ MPs considered hospitals and health centre infrastructure (84%); maternal and new born health (66%); immunization (53%); and medical staff salaries (47%) as more important than nutrition

(45%). This is evident that nutrition is not ranked among the top four issues overall. MPs considered hospitals and health centre infrastructure (84%); maternal and new born health (66%); immunization (53%); and medical staff salaries (47%) as more important than nutrition (45%). Furthermore, more than two thirds of the MPs were unaware of the allocations for nutrition interventions within the health sector budget. Consequently, it is important that MPs know more about the adverse impacts of malnutrition as well as the policy challenges faced in addressing this important issue (MoH, 2011).

2.2.5 Infections: these may reduce appetite, increase energy and nutrient utilization (e.g. to fight infection) and limit the ability to absorb or retain nutrients (e.g. as a consequence of diarrhoea and/or intestinal parasites) (WHO, 2011).

2.3 Specific interventions to control malnutrition

According to Bachou (2014), some Proven, Effective Interventions to Improve Nutrition include: Promotion of optimal breastfeeding, promotion of appropriate complementary feeding, Improved hygienic practices, vitamin A supplementation, de-worming , Iron-folic acid and calcium supplements for pregnant and lactating women, family planning to promote smaller family size, increase birth spacing, and delay first pregnancy until after the adolescent years, promotion of good nutrition for adolescent girls and pregnant and lactating women , salt iodization, industrial fortification and bio fortification of staple foods, multiple micronutrient powders, prevention of chronic malnutrition, treatment of severe acute malnutrition with special foods, such as ready-to-use therapeutic foods.

2.3.1 Competence and collaboration of care workers

Health care professionals play significant role in everyone's lives. Their importance is emphasized on lives of those who live in developing countries; living in poverty, suffering from under nutrition and various diseases, they do not have access to information provided by independent sources due to illiteracy. These are people who depend totally on the skills and knowledge of healthcare workers (MoH, 2012).

Health care professionals such as nurses, midwives and doctors and their national and international co-workers play a very important role in promoting maternal care, newborn and child health. They also have a unique role of educating and training people. Health care workers can also influence in some level, to national healthcare policy (The Partnership for maternal, newborn and child health, 2006).

2.3.2 Reduction of child mortality rate

There has been reduction of infant mortality in the world. However, the rate of reduction is low in Sub-Saharan Africa region. It is clearly shown that the reduction of infant mortality rate after approximately twenty years was at 20 per cent. Improving health is one of the central goals of the World Bank 2010. Many countries have emphasised on primary health care, safe motherhood initiatives, including immunization, sanitation and access to safe drinking water. As can be seen, the reduction of child mortality is affected by the same key interventions that are in the centre of prevention of under nutrition. (World Bank, 2010).

2.3.3 Improving mother's health

It is important to pay attention to mothers' health by increasing assistance from skilled health personnel during pregnancy and delivery. This includes adequate supply of equipment's and access to emergency obstetric care. Pregnant mothers should visit at least four times antenatal care during their pregnancy. Many under aged mothers are exposed to unwanted pregnancies which require access to counselling and information on birth control methods. Unwanted pregnancies affects both the mother's and the child's health and their future prospects. Making pregnancies wanted and childbirths safe prevents maternal deaths and saves children's lives (UNICEF, 2013).

2.3.4 Emphasis on the importance of breast feeding

Breastfeeding during the first six month of the child's life is one of the most cost-effective means to reduce the risk of a young infant dying due to pneumonia or diarrhea and help a child to survive severe conditions prevailing in developing countries. Statistics show that exclusive breast feeding has increased in many high-mortality countries in the early 90's. Despite this trend less than 40 percent of children less than six month of age are exclusively breastfed in developing countries. Many studies have shown that exclusive breast feeding practices are vitally important

in reducing children's under nutrition and morbidity to above mentioned pneumonia and diarrhea (UNICEF, 2012).

According to WHO proper infant feeding practices are key to child survival, breastfeeding is the best, easiest, and most cost-effective method to ensure and maintain child's proper nutrition and health. Annually more than 1.4 million deaths in children under five in the developing world could be prevented with optimal breastfeeding. Children under two years of age have the greatest potential for a positive impact of breastfeeding on child survival. Statistics show that breastfed children have at least six-times greater chance of survival in the early months than those who have not been breastfed. Multiple studies show that breastfeeding dramatically decreases deaths from diarrhea and acute respiratory infections as well as from other infectious diseases. Acute respiratory infections and diarrhea are the major child killers in the world (WHO, 2011)

2.3.5 Key interventions in Uganda

International Non Governmental Organisations (NGOs) partner to start local food production projects in poor communities of Uganda that suffers from chronic poverty, malnutrition, food shortages and frequent drought as well as other natural disasters. Such small villages projects include the Karamoja Productive Assets Programme (KPAP) where Department for International Development (DFID) World Food Programme (WFP) partner with the government of Uganda to work against food crisis to ensure constant access to food in the communities (DFID, 2011).

Other initiative from international NGO such as Harvest Plus include holding training workshops with farmers talking about food varieties and their benefits such as the importance of foods rich in vitamins A to improve health. In addition, they distribute such food seedlings to farmers to grow nutritious food rich in vitamins, proteins, carbohydrates, minerals and fats for both household consumption and income generation (DFID, 2012).

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter described the study area focusing on Geographical location, population structure and many other aspects including Study design, sample size determination, sampling method, selection criteria, data Collection, data analysis, data presentation, data quality control, study limitation and Ethical consideration.

3.1 Study area

The study was carried out in Kirumya sub-county, Bundibugyo district in western region Uganda bordered by Ntoroko district to the northeast, Kibaale district to the east, Kabarole district to the south and Democratic Republic of Congo to the west. Bundibugyo is approximately 32 kilometres (20 miles) by road, west of Fort portal. This is about 72 kilometres (45miles)by road north of Kasese town one of the biggest towns in the region, and approximately 379.7 Kilometres from Kampala the capital city of Uganda. In 2012, the population of the district was estimated at 261,100 people.(UBOS, 2012).

3.2 Study design

A descriptive cross sectional study was used for children under five years in among households in Kirumya sub-county, in Bundibugyo district where mothers of children interviewed.

3.3 Sample Size determination

The sample size was determined using Fishers *et al*, 2003 formula .The formula was used to estimate the smallest possible categorical sample size since the population for children in Kirumya sub-county is big.

$$n = \frac{z^2 pq}{d^2}$$

Where

n= minimum sample size

d = margin of error

z=standard normal deviation corresponding to 1.96

p= prevalence (17.4).

q=1-p

Therefore taking

$p = 17.4/100 = 0.174$ (Uganda Demographic Health Survey, 2011)

$z = 1.96$

$q = 1 - p = 0.826$

$d = 5\%$ or 0.05

$$n = \frac{1.96^2 \times 0.174 \times 0.826}{0.05^2}$$

$n = 220$ children

Therefore the sample size was 220 children

However, due to limited resources and limited time, exactly a half of the value of n was used.

Therefore, the sample size was 110 children.

3.4 Study population

The study was done among children under five year age in Kirumya sub-county.

3.5 The sampling method

The study was carried out among children under five year age in Kirumya sub-county, a total of 110 children was considered and using a random sampling where all those who came within the time of the study were considered for an interview and caretakers or any elder participating in the study were considered to provide relevant information on behalf of the children.

3.6 Inclusion and exclusion criteria

The study included all households with children under five year of age, all children under five year age of intended population whose caretakers accepted to give consent, parents and caretakers of children under five year age living in Kirumya sub-county. Children above five years of age, those who had emergency medical conditions, parents and caretakers of children who did not give consent, were excluded.

3.7 Study Tools/ Instruments

Structured questionnaires, observing checklist and writing materials (pencils & pens), examination tools such as Shakir's tape, tape measure.

3.8 Data collection method

3.8.1 Study questionnaire

The data was collected using both open and close ended structured questionnaire about socio-demographic, characteristics (appendix i), the data was collected by the principle investigator himself and three research assistants. The questionnaires were filled by the patient's guardian / attendant.

3.8.2 Clinical examination

Thorough general and systemic examination was done, and vital signs were taken. Diagnosis of under-nutrition was based on weight/height or length and MUAC as explained below.

3.8.2.1 Weight measurements

Infants under two years of age were weighed using a 25kg Salter hanging scale (CMS) Weighing equipment, High Holborn, London United kingdom) while those above two years of age were weighed while standing on the measuring board. The scales were adjusted to zero before each measurement. The child's weight was recorded to the nearest 100 grams and was then measured daily during the morning before ward round. The reference which was applied was of WHO chart of wasting which compared Weight/length or weight/height and stated the grade of malnutrition.

3.8.2.2 Length / Height measurements

In patients up to the age of 24 months, length was measured using a length board in the recumbent position by two examiners. For those above 24 months and who were able to walk, height was measured while standing using a height meter. Weight for height/length and Z score of less than -1 was indicated as mild -2 was indicated as moderate and -3 was indicated as severe wasting.

3.8.2.3 Mid-upper arm circumference (MUAC)

Measurements were done midpoint between acromion and olecranon process by tape measure on the left arm. The reading was recorded to the nearest 0.1cm. Children with MUAC of 12.5-13.5cm were mild, 11.0 to 12.5cm were considered moderate and less than 11cm were considered severe malnourished.

3.9 Data Analysis and presentation

The data collected from the study was computed using Microsoft excel. The analysis was made in line with the study objectives so as to achieve the purpose of the study and was presented in form of tables, pie-charts, bar-graph, and narratives depending on the data analyzed.

3.10 Data quality control

To ensure quality control, the researcher prior to the exercise conducted one day training for three research assistants who there-after set for field testing of the study tools . A total of six questionnaires were distributed for the pre-test. The research assistants were supervised closely by the principle invigilator himself.

3.12 Ethical Consideration

The study was carried out after the approval of the proposal by the university.

An Introductory Letter from the Administrator school of Allied health sciences was obtained.

The researcher obtained permission from the administration of Kirumya subcounty Community leaders, local elders, through verbal informed consent.

Respondents were requested for their consent prior to the interviews.

Confidentiality was maintained all through the research process and the interviews were conducted in reasonable privacy by use of codes that were only known by responsible parties other than use of names, and ensuring not to disclose their information to third parties without their consent.

CHAPTER FOUR: RESULTS

4.0 Introduction

This chapter presents the Results, Analysis and interpretations of findings of the study according to the specific study objectives. Findings and results are presented in form of bar graphs, pie charts, tables and figures.

Study results.

From the study conducted, the following results were obtained from a sample of 110 respondents in Kirumya sub-county, Bundibugyo district.

4.1 PART A: SOCIAL DEMOGRAPHIC CHARACTERISTICS

I. For the mother

Table I: Showing socio-demographic characteristics of mothers

Characteristic	Category	Frequency(n)	Percentage(%)
Age	<20 years	12	10.9
	20-30 years	54	49.1
	30-40 years	36	32.7
	>40 years	08	7.3
	Total	110	100

Occupation	Student	3	2.7
	Business women	15	13.6
	Unemployed	05	4.5
	Peasant	61	55.5
	Civil servant	08	7.3
	Others	18	16.4
	Total	110	100
Marital status	Single	18	16.4
	Married	72	65.5
	Widowed	12	10.9
	Divorced	08	7.3
	Total	110	100
Tribe	Mwamba	53	48.2

	Mubwisi	29	26.4
	Mutooro	04	3.6
	Mukonzo	14	12.7
	Others	10	9.1
	Total	110	100
Religion	Catholic	39	35.5
	Protestant	31	28.2
	Muslim	23	20.9
	Pentecostal	14	12.7
	Others	03	2.7
	Total	110	100
Number of children	1	21	19.1
	2-4	49	44.5
	5-7	34	30.9
	>7	06	5.5
	Total	110	100

From table I, concerning socio-demographic characteristics of mothers majority 54(49.1%) Were between 20 and 30 years, followed by 36(32.7%) who were between 30 and 40 years, and 8(7.3%) were above 40 years of age.

Regarding the occupation, majority 61(55.5%) of the mothers were peasants, next were those who had other forms of occupation 18(16.4%), followed by business women 15(13.6%), civil servants such as teachers 8(7.3%), unemployed women 5(4.5%) and lastly 3(2.7%) who were students.

Concerning marital status of the mothers, majority of them that were interviewed 72(65.5%) were married, 18(16.4%) were single mothers, 12(10.9%) were widowed mothers and lastly 8(7.3%) were divorced.

Tribes of mothers and their children were distributed as follows; majority of them 53(48.2%) were Bamba, whereas 29(26.4%) of them were Babwisi, 4(3.6%) were Batooro, 14(12.7%) were Bakonzo and lastly 10(9.1%) belonged to other tribes like Banyankole, Banyoro and Congolese.

Majority of the mothers 39(35.5%) were Catholics by religion, 31(28.2%) were protestants, 23(20.9%) were Muslims whereas 14(12.7%) and 3(2.7%) belonged to Pentecostal and other religions respectively.

Majority of them 49(44.5%) had between 2 and 4 children, followed by 34(30.9%) who had between 5 and 7 children, 21(19.1%) who had only one child and 6(5.5%) who had more than 7 children.

II. For the child

Table II: Showing the social demographic characteristics of the children

Age group	<12 months	21	19.1
	12-23 months	30	27.3
	24-59 months	59	53.6
	Total	110	100

Gender	Male	69	62.7
	Female	41	37.3
	Total	110	100
Birth order	First borne	36	32.7
	Second borne	40	36.4
	Third borne	23	20.9
	Forth borne	11	10
	Total	110	100

Concerning the social demographic characteristic, out of 110 children whose mothers participated in the study, 21(19.1%) were less than 12 months of age, 30(27.3%) were between 12 and 23 months of age, 59(53.6%) were between 24 and 59 months of age. Also 69(62.7%) of them were males, 41(37.3%) were females.

Majority of them 40(36.4%) of the children were second borne, followed by 36(32.7%) who were first borne, and 23(20.9%) and 11(10%) were third borne and forth borne respectively.

4.2 PART B: PREVALENCE OF UNDER NUTRITION AMONG UNDER FIVE CHILDREN

Table III: Showing prevalence of under-nutrition among under five children.

Variables	Undernourished	Frequency (n)	Percentage	Average percentage for malnutrition

Weight-for-age	Normal (above 80%)	99	90	
	Moderate underweight (60%-80%)	8	7.3	5
	Severe underweight (below 60%)	3	2.7	
	Total	110	100	
MUAC	Normal (above 13.5 cm)	97	88.2	
	Moderately malnourished (12.5- 13.5cm)	9	8.2	5.9
	Severely malnourished(<12.5 cm)	4	3.6	
	Total	110	100	

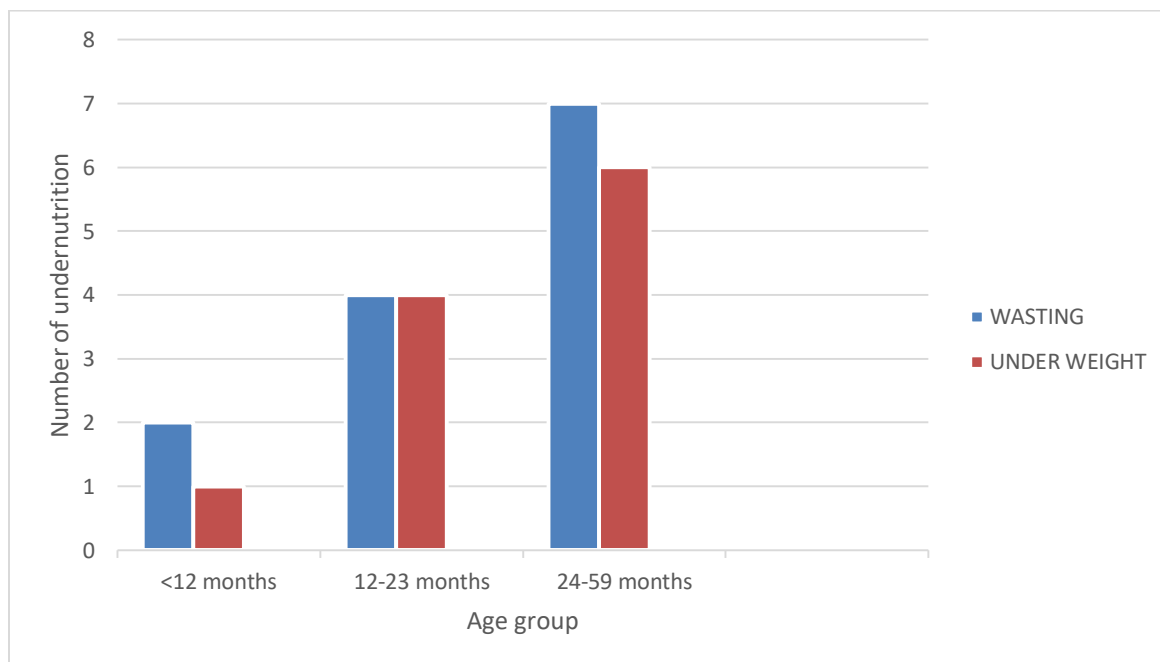
Out of 110 children enrolled in the study, majority of them 99(90%) were having normal weight for age (with normal standard weight for age above 80%).

A total of 11 children on average (5%) of them were having low weight for age of which 8(7.3%) had moderate underweight (60%-80%) and 3(2.7%) of them with severe underweight (below 60%).

On the other hand, 97(88.2%) were normal (with arm circumference above 13.5cm) A total of 13 children were wasted, on average 5.9% of which majority 9(8.2%) were moderately thin for their age (with moderate MUAC 12.5-13.5cm), 4(3.6%) were severely thin for their age (with MUAC <12.5cm).

Distribution of under nutrition with age of the child

Figure I: Showing prevalence of malnutrition in different age groups

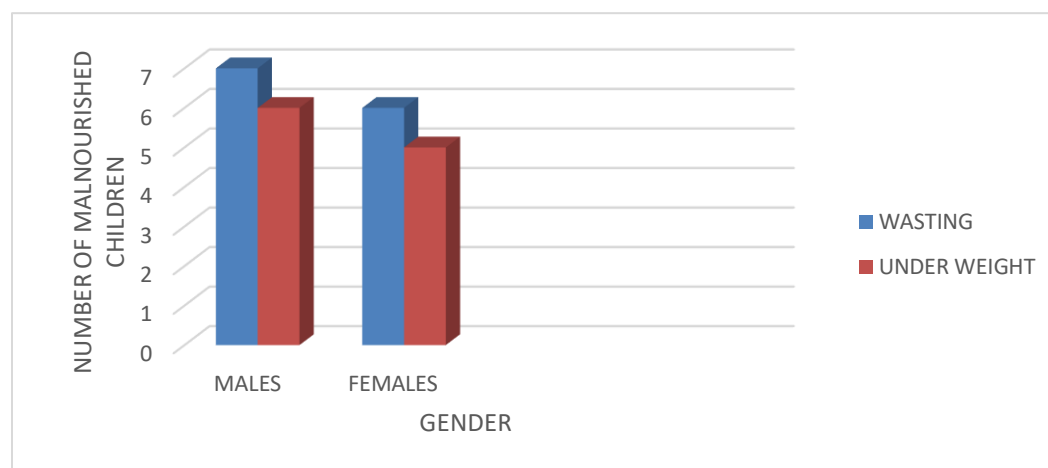


From the figure above, it is shown that among the undernourished children 7 of them who were wasted and 6 of them who having underweight belonged to age group 24-59 months, 4 of those who were wasted and other 4 who had underweight belonged to age group of 12-23 months and

lastly 2 of whom were wasted and 1 of those with underweight belonged to age group of less than 12 months.

Malnutrition and gender among under five children

Figure II: Showing prevalence of malnutrition in different gender



From figure ii, 7 of the children that were wasted and 6 that were having low weight for age belonged to male gender whereas 6 of the wasted and 5 of those with low weight for age were females. It is there shown that males were more undernourished compared to female children.

4.3 PART C: FACTORS ASSOCIATED WITH OCCURRENCE OF MALNUTRITION

Table IV: Showing factors associated with occurrence of malnutrition

VARIABLE	Under weight		Wasting	
	Frequency	Percentage	Frequency	Percentage
1. Breast feeding and malnutrition				
Breast fed<6 months	3	27.3	4	30.8

Breastfed 6-12 months	2	18.2	1	7.7
Breast fed 13-18 months	2	18.2	2	15.4
Apparently breast feeding	1	9.1	3	23.1
Never breast fed	3	27.3	3	23.1
2. Infection and malnutrition				
Recent infection	7	63.6	8	61.5
No recent infection	4	36.4	5	38.5
3. Under nutrition and age of the mother				
<20 years	5	45.5	6	46.2
20-30 ears	2	18.2	3	23.1
30-40 years	4	36.4	4	30.8

From the table above, the factors associated with occurrence of under nutrition were as follows
Breastfeeding: Out of 11 children that were having low weight for age 3(27.3%) of them were breast fed below 6 months, 2(18.2%) had been breast fed between 6 and 12 months, and 2(18.2%) had been breastfed between 13 and 18 months, only 1(9.1%) of them was apparently being breastfed and 3(27.3%) had never been breastfed but were being fed on other feeds. On the other hand, out of 13 children that were wasted, 4(30.8%) of them had been breastfed less than 6

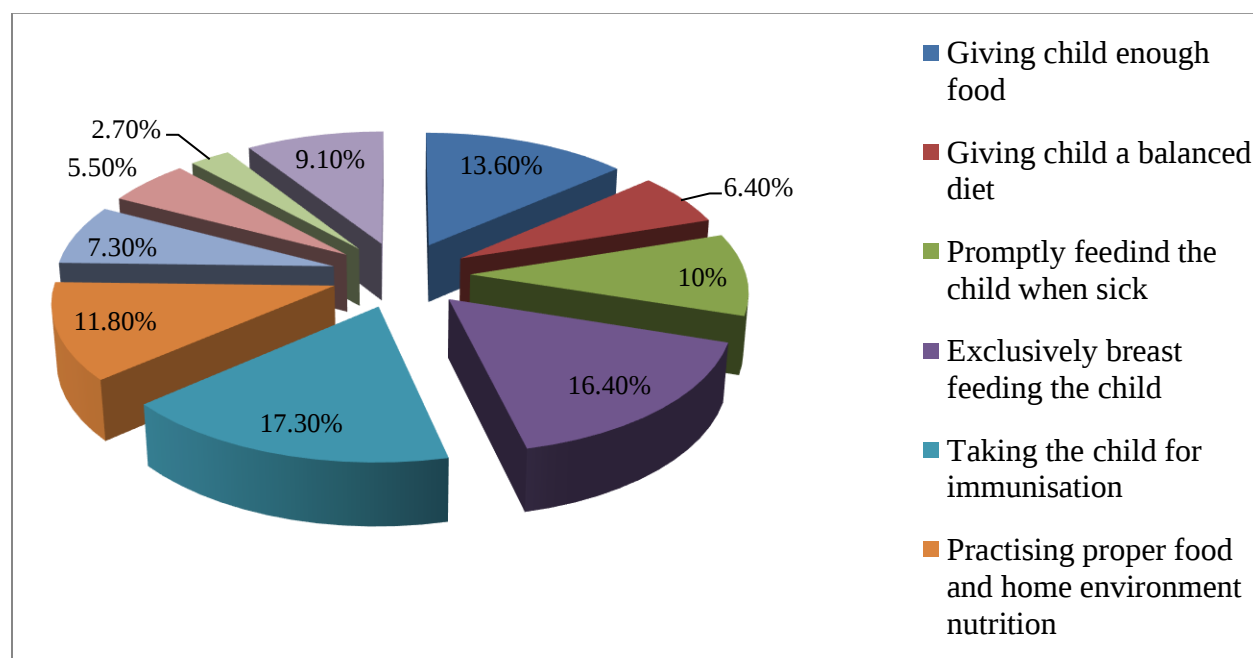
months, only 1(7.7%) of them had been breastfed between 6 and 12 months, 2(15.4%) had been breastfed between 13 and 18 months, 3(23.1%) were apparently being breastfed and 3(23.1%) had never been breastfed.

Infection: Out of 11 children that were having low weight for age, 7(63.6%) had suffered from an infection such as measles, malaria, respiratory tract infection and diarrhea of recent and 4(36.4%) had no history of recent infection. On the other hand, out of 13 of children that were wasted 8(61.5%) had suffered from an infection, and 5(38.5%) had no history of recent infection.

Age of the mother: Out of 11 children that were having low weight for age 5(45.5%) of them their mothers were below 20 years of age, 2(18.2%) their mothers were between 20 and 30 years, 4(36.4%) of them their mothers were 4(36.4%). On the other hand out of 13 children that were wasted, 6(46.2%) their mothers were less than 20 years, 3(23.1%) of them their mothers were between 20 and 30 years and 4(30.8%) their mothers were between 30 and 40 years.

PART D: SPECIFIC INTERVENTIONS INTERVENTION TO CONTROL MALNUTRITION UNDER FIVE

Figure III: Showing specific interventions to control malnutrition



Out of 110 mothers that were interviewed, and asked about specific interventions taken to control occurrence of malnutrition among their children under five years, majority of them 18(17.3%) said they would take their children for immunization, followed by 18(16.4%) who said they exclusively breast feed their children, 15(13.6%) said they give their children enough food, 13(11.8%) who said they would be practicing proper food and home environment hygiene to prevent risk factor for infections, 11(10%) who said that they would do it by promptly feeding the child when sick, 10(9.1%) who ensured good feeding when pregnant, 8(7.3%) who said seeking medical attention when child is sick is better control measure, 7(6.4%) who said giving their children a balanced diet is better, 6(5.5%) said ensuring good feeding when breast feeding their children would work better to control and prevent malnutrition and lastly 3(2.7%) of the mothers said that they would take their children to the child clinic for regular body weight assessment to monitor growth.

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the discussions, conclusion and recommendations of the study findings that were presented in the previous chapter. These were basically presented according to the study objectives.

5.1 Discussion

5.1.1 Prevalence of malnutrition among under five in Kirumya sub-county

The prevalence/frequency of malnutrition is shown in table III, figure I and figure II. Two forms of malnutrition were found out in the study area which were underweight and wasting as stated by the Uganda Demographic and Health Survey (2011) and Lancet Nutrition Series (2013) among other forms. Out of 110 children that were enrolled in the study, a total of 11 (10%) children were found to be having underweight for age of which, 13 (11.8%) of them were found to be wasted contrarily to the studies done by Turyashemerwa *et al.*, (2009) in peri-urban Kabarole who showed to be under-weight and wasting was 15.7% and 3.4% respectively. In Kirumya sub-county wasting was the more frequent form of under nutrition among under five children compared to underweight.

The distribution of under nutrition among age groups was more prevalent among those between 24 and 59 months possibly because of early weaning, lack of breast feeding in adequate child spacing.

5.1.2 Factors associated with occurrence of malnutrition among under five in Kirumya sub-county

Accordingly, short duration of breast feeding was highly associated with occurrence of malnutrition where those who were never breast, breastfed less than 6 months were highly associated with underweight and wasting this is similar to results in the study done by (UBOS, 2011) that only 63% and 41% of children under the age of 6 months and aged 4-5 months respectively are exclusively breastfeed and many never breastfed was highly associated with under nutrition. From the current study it is shown that children breastfed between 6 and 12 months and those between 13 and 18 months were less affected by under nutrition. This is

because breast milk provides primary immunity to the child in early stages of life hence preventing infections that contribute to malnutrition.

In addition, infection was another major factor for occurrence of under nutrition where in the current study it was responsible for 7(63.6%) children having low weight for age and 8(61.5%) of children wasted. The presence of infection and disease are associated with under nutrition among under five. Similarly in another study done by (Lisa, Ramakrishnan, Ndiaye, Haddad, and Martorell, 2003) who in their study stated that HIV, measles, hookworms, diarrhea among other infections are examples of basic factors and cause of under nutrition among under five. Infection is highly associated with poor hygiene and poor sanitation as stated by (Prakash, 2010). This is because infection make a child lose appetite for food, increase energy and nutrient utilization and limit the ability to absorb or retain nutrients, make the child get diarrhea and vomiting reducing the rate of absorption of food hence under nutrition as stated by (WHO, 2011).

Furthermore, maternal age below 20 years was also found to be an associated factor for occurrence of undernutrition in the current study where most of the children 5(45.5%) of the children with underweight and 6(46.2%) with wasting. This factor was also stated in a study done by (MoH, 2010) that by the age of 20 years, over 70 % of women are already married. Almost one fifth of all pregnancies in Uganda are happening among women younger than 20 years of age which is way too early than the internationally recommended age of 20 years at first pregnancy. As a result, 12 % of women are considered too thin - a situation that increases risk for complications during birth and leads to low birth weight of babies at birth—up to 14 % of newborns are of low birth weight. Tragically, the low weight at birth contributes to 34 % of all newborn mortality due to under nutrition.

5.2 Conclusion

From the findings of the study it is concluded that;- Two forms of under-nutrition are prevalent in Kirumya sub-county location. These are wasting and underweight.

The study showed that prevalence of under nutrition among under five children is still high, in particular higher among those between 24 and 59 months and higher in males than females which requires several activities from MOH, health professional and mothers and caretakers of children themselves. The factors associated with occurrence of malnutrition were showed to be,

inadequate breast feeding, infections and maternal age below 20 years among other factors hence a great deal of interventions still needed to reduce the burden of malnutrition which is dependent on these factors.

5.3 Recommendations

5.3.1 To the policy makers

Health workers should be encouraged to regularly take body weight gain to ensure good growth to the fetus and good start in life for the new-born.

Micro nutrients supplements such as Iron and folic acid tablets should be given for more than 90 days during pregnancy and lactation/ breastfeeding.

Mothers should be encouraged to breastfed within first hour of child's life. Early initiation of breastfeeding is one of the most effective interventions for child health: It provides nutrients, warmth, and immunological protection for the baby.

Mothers should be taught the benefits of breastfeeding in nutrition, for example feeding the baby breast milk only up to the age of 6 month: Exclusive Breastfeeding is the best way to meet the nutritional needs of infants. No additional food or drink is needed before the six months of a child's life. Exclusive breastfeeding limits exposure to virulent microorganisms and reduces infants' risk of infection (particularly diarrheal diseases) and provides all the nutrients that a baby requires. Even if the mother is HIV positive, she should exclusively breastfeed her baby and take ART drugs to prevent mother-to-child HIV transmission.

Mothers should be encouraged to give their children adequate complementary solid food after six months for example giving daily breast milk as baby desires or if not breastfeed, any animal milk coupled with 2-3 meals daily prepared from 3 - 4 types of foods (for example: posho or matooke cooked on milk or soup of vegetables or meat if available. Greens and groundnut sauce added with oil or butter should also be mixed in; if available, boiled egg or small piece of fish or meat; for snacks – small pieces of fruits and vegetables).

Prompt treatment of infection and proper nutrition when the baby is sick should be also emphasized including proper feeding after recovery.

Proper nutrition among female teenagers and the pregnant especially micronutrient intake during pregnancy (critical for brain development of the child) should be promoted and encouraged.

5.3.2 For further researches

1. Further studies should evaluate the impact of the nutritional interventions on the prevalence of under-nutrition in Kirumya sub-county.

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APPENDICES

APPENDIX I: STUDY QUESTIONARE

Section A .Consent

I am **MUGANZI HANLORD** ,a third year student doing a diploma in clinical medicine and community health at Kampala International University –Western Campus(KIU-WC) doing a study of “*prevalence of malnutrition among children under five in Kirumya sub-county, Bundibugyo district.*”

Your participations in this study is completely free and voluntary .You have a right to say no or change your mind and withdraw at any time .Whether you choose to participate or not it will have no effect on the services to be given to you .All information that is to be obtained from you in this study will remain confidential and will only be disclosed with your permission.

I hope that this information will be used to draw intervention on prevalence of malnutrition among under five year children.

THANK YOU.

Name of investigator.

..... Date.....

Section B: Socio-demographic characteristics.

I. For the mother

Age

- | | |
|---------------|----------------------|
| a) <20 years | <input type="text"/> |
| b) 20-30years | <input type="text"/> |
| c) >40 years | <input type="text"/> |

Education level:

- | | |
|--------------------|----------------------|
| a) Primary level | <input type="text"/> |
| b) Secondary level | <input type="text"/> |

- c) Post-secondary level
- d) Never went to school
- e) Others (specify).....

4. Occupation

- a) Student
- b) Businesswoman
- c) House wife
- d) Peasant
- e) Civil servant
- f) Others (specify).....

5. Marital status

- a) Single
- b) Married
- c) Widow

6. Tribe

- a) Mwamba
- b) Mubwisi
- c) Mutooro
- d) Mukonzo
- e) Others.....

7. Religion

- a) Catholic
- b) Protestant
- c) Muslim
- d) Pentecostal
- e) Others.....

8. Number of children

- a) 1
- b) 2-4
- c) 5-7
- d) >7

II. For the child as given by mother

Age group

- a) <12 months
- b) 12months -23months
- c) 24-59 months

Tribe

- f) Mwamba
- g) Mubwisi
- h) Mutooro
- i) Mukonzo

Others.....

Gender

- a) Male
- b) Female

Birth weight

- a) <2.5
- b) 2.5-3.5
- c) >3.5

Immunization status

- a) Fully immunized
- b) Partially immunized
- c) Not immunized

Section c: Other factors associated with malnutrition

Is your child breast feeding?

a) YES ☐

b) NO ☐

After how long did you initiate the child on breast feeding?

<1 hour

>1 hour

For how long did you breastfeed the child?

a) Never breast fed

b) <3 months

c) 3-6months

d) >6months

Family staple food

a) Matooke

b) Posho

Type of food child fed on

a) Matooke

b) Posho

c) Vegetables

d) Fruits

e) Milk

What is major source of income for the house hold?

.....

Does the household sell food to get money for other basis needs?

a) YES

b) NO

Do you buy some food types?

a) YES

b) NO

Do you know what comprises of good feeding?

- a) YES
- b) NO

Do you think poor feeding makes the child unhealthy?

- a) YES
- b) NO

Do you have any food taboos in the family?

- a) YES
- b) NO

Which type of family do you have?

- a) Extended family
- b) Nuclear family

Has the child received any supplements such as vitamin A?

- a) YES
- b) NO

Has the child been dewormed?

- a) YES
- b) NO

Has the child suffered infection of recent?

- a) YES
- b) NO

How far is it from home to the health centre?

- a) <5km
- b) 5-10km
- c) >10km

Section d: Specific interventions to control occurrence of malnutrition

What has been done to control malnutrition at household level?

.....

What has been done by health care providers to control malnutrition?

.....

What has the policy done control the occurrence of malnutrition

.....

THANK YOU

APPENDIX II: DATA COLLECTION APPROVAL FORM

APPENDIX II: DATA COLLECTION APPROVAL FORM



School of Allied Health Sciences (SAHS) Ishaka,
P.O. BOX 71 Bushenyi,
Tel: 0703786082/0773786082
Email: christinekyobuhaire@gmail.com

OFFICE OF THE ADMINISTRATOR - SAHS

21st April 2017

The Chairperson Kirumya Sub-county
BUNDIBUGYO DISTRICT

Dear Sir/ Madam,

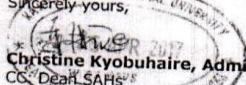
SUBJECT: DATA COLLECTION

Academic research project is an Academic requirement of every student pursuing a 3 year Diploma in Clinical Medicine & Community Health (DCM) of Kampala International University- Western Campus (KIU-WC). DCM program is housed in the School of Allied Health Sciences (SAHS).

The students have so far obtained skills in Proposal writing especially chapter one, Three & Questionnaire design. The student's topic has been approved by SAHS Research Unit and is therefore permitted to go for data collection alongside full proposal & dissertation writing. As you may discover the student is in the process of full proposal development. However, the student MUST present to you his questionnaire and his research specific objectives that he wishes to address. We as academic staff of Allied Health Sciences are extremely grateful for your support in training the young generation of Health Professionals. I therefore humbly request you to receive and allow the student **MUGANZI HANLORD** Reg. No. **DCM/0150/143/DU** in your area to carry out his research. His topic is hereby attached. Again we are very grateful for your matchless support and cooperation.

Topic: **PREVALENCE OF MALNUTRITION AMONG CHILDREN UNDER FIVE IN KIRUMYA sub COUNTY, BUNDIBUGYO DISTRICT.**

Sincerely yours,


Christine Kyobuhaire, Administrator- SAHS

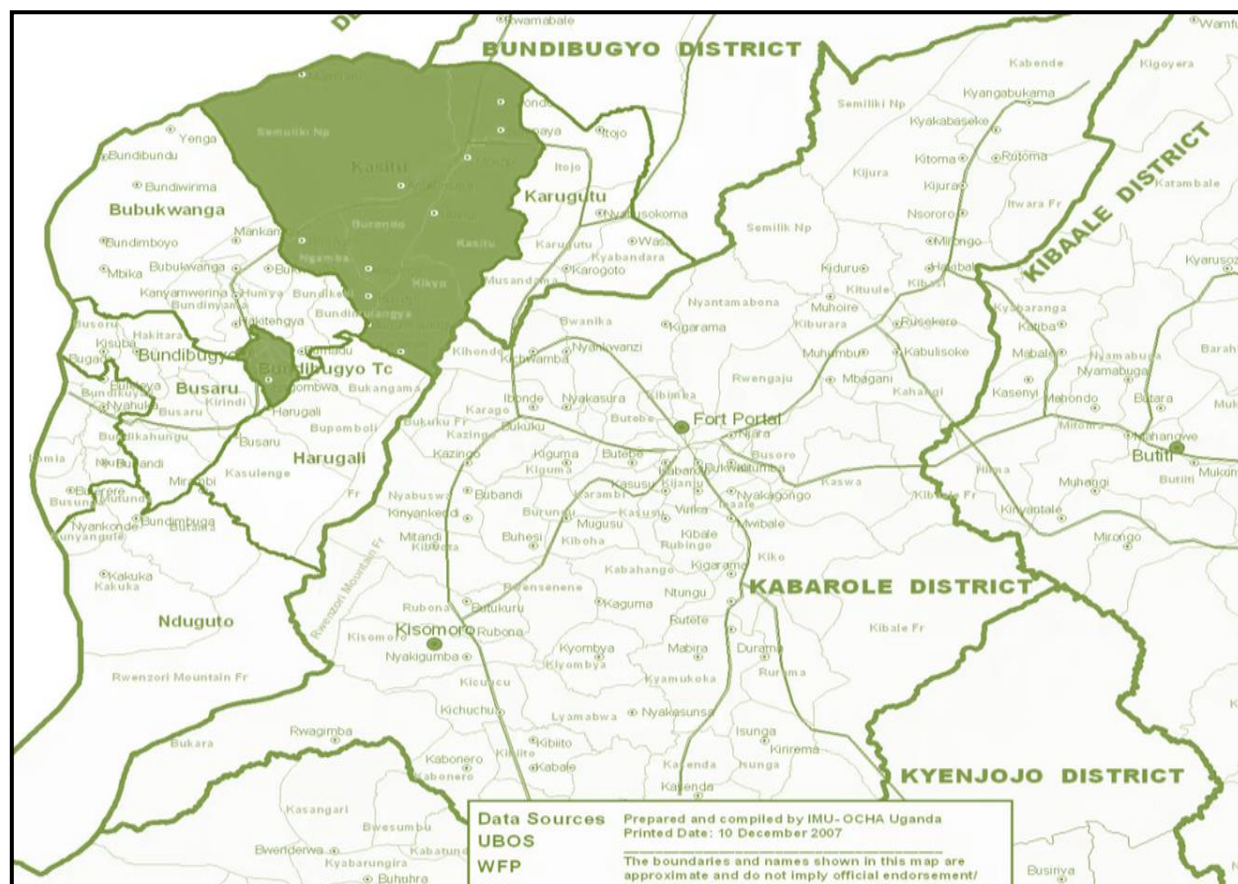
CC: Dean SAHS
CC: Associate Dean SAHS
CC: Coordinator, Research Unit- SAHS
CC: H.O.D Dept. Public Health
CC: H.O.D Laboratory Sciences
CC: Coordinators; TLC & DEC

"Exploring the Heights"

APPENDIX III: MAP OF UGANDA SHOWING LOCATION OF BUNDIBUGYO DISTRICT.



APPENDIX IV: MAP OF BUNDIBUGYO DISTRICT



KEY:



KIRUMYA SUB COUNTY